Examiner-Initiated Interview Summary	Application No. 09/966,538	Applicant(s) RIDDLE, GUY
	Examiner QING-YUAN WU	Art Unit 2194

All Participants:

(1) *QING-YUAN WU*.

(2) *Mark Spolyar*.

Status of Application: _____

(3) _____.

(4) _____.

Date of Interview: *19 February 2008*   **Time:** *2pm*

Type of Interview:

☒ Telephonic

☐ Video Conference

☐ Personal (Copy given to: ☐ Applicant   ☐ Applicant's representative)

Exhibit Shown or Demonstrated: ☐ Yes   ☒ No
If Yes, provide a brief description:

Part I.

Rejection(s) discussed:
35 USC 101

Claims discussed:
1-5,7-18,20-22 and 24-27

Prior art documents discussed:
N/A

Part II.

SUBSTANCE OF INTERVIEW DESCRIBING THE GENERAL NATURE OF WHAT WAS DISCUSSED:
General discussion of proposed amendment to be enter as examiner's amendment

Part III.

☐ It is not necessary for applicant to provide a separate record of the substance of the interview, since the interview directly resulted in the allowance of the application. The examiner will provide a written summary of the substance of the interview in the Notice of Allowability.

☐ It is not necessary for applicant to provide a separate record of the substance of the interview, since the interview did not result in resolution of all issues. A brief summary by the examiner appears in Part II above.

WILLIAM THOMSON
SUPERVISORY PATENT EXAMINER

(Applicant/Applicant's Representative Signature – if appropriate)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appl. No.:   09/966,538
Applicant: Guy Riddle
Filed: September 26, 2001
Title: Dynamic Partitioning of Network Resources

Docket No.:   6533/53640
Customer No.:   30505

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

PROPOSED CLAIMS FOR EXAMINER'S AMENDMENT

To: Examiner Qing Wu

Fax: 571-273-3776

From: Mark Spolyar

Re: Proposed Amendment

Examiner Wu,

Attached are proposed amendments of the claims in the application identified above.

Regards,

Mark Spolyar

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Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (currently amended) ~~An apparatus~~ A computer-readable medium stored therein computer-readable instructions executed by a computer processor allowing for the dynamic allocation of network resources among a plurality of users, the computer readable instructions comprising:

~~a partition object space, defined in a computer-readable memory, storing a plurality of partition objects; the plurality of partition objects including at least one dynamic partition object having at least one attribute defining a first allocation of network bandwidth across all data flows corresponding to the at least one dynamic partition object, and a second attribute defining user partition allocations of the network bandwidth within the first allocation, wherein the user partition allocations are each less than the first allocation; and at least one user partition object having at least one attribute defining an allocation of the network bandwidth across all data flows corresponding to a user;~~

a partition management module ~~operative to~~ that

accesses ~~the~~ a partition object space in ~~the~~ a computer-readable memory, wherein the partition object space stores a plurality of partition objects; the plurality of partition objects including at least one dynamic partition object having at least one attribute defining a first allocation of network bandwidth across all data flows corresponding to the at least one dynamic partition object, and a second attribute defining user partition allocations of the network bandwidth within the first allocation, wherein the user partition allocations are each less than the first allocation; and at least one user partition object having at least one attribute defining an allocation of the network bandwidth across all data flows corresponding to a user, ~~and to:~~

selects partition objects based on one or more attributes of data flows;

~~identify~~ identifies new users based on at least one packet attribute of packets in the data flows;

dynamically creates, when a dynamic partition object is selected, ~~dynamically create~~ a user partition object in the partition object space in response to an identification of a new user, wherein the dynamically created user partition object is a child of a selected dynamic

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partition object and includes an allocation of the network bandwidth according to the second
attribute of the selected dynamic partition object, and

   a partitioning mechanism that

      interfaces with ~~operably connected to~~ a communication path for transmitting
data packets corresponding to a plurality of respective users,

      ~~wherein the partitioning mechanism is operative to:~~

      associates users with corresponding user partition objects, and

      enforces the respective network bandwidth allocations defined in the dynamic
and user partition objects.

2. (currently amended) The <u>computer-readable medium</u> ~~apparatus~~ of claim 1 wherein the
partition management module is further operative to delete inactive user partition objects from
the partition object space.

3. (currently amended) The <u>computer-readable medium</u> ~~apparatus~~ of claim 2 wherein the
partition management module is operative to reclaim user partition objects from the partition
object space as required for new users.

4. (currently amended) The <u>computer-readable medium</u> ~~apparatus~~ of claim 2 wherein an
inactive user partition object is identified in relation to a threshold period of inactivity.

5. (currently amended) The <u>computer-readable medium</u> ~~apparatus~~ of claim 3 wherein an
inactive user partition object is identified in relation to a threshold period of inactivity.

6. (canceled)

7. (currently amended) The <u>computer-readable medium</u> ~~apparatus~~ of claim 1 wherein each
dynamic partition object is associated with a characteristic of the data packets transmitted in
the communication path, wherein the partition management module is operative to identify the
dynamic partition object associated with a data packet and create a corresponding user

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partition object.

8. (currently amended) ~~An apparatus~~ A computer-readable medium stored therein computer-
readable instructions executed by a computer processor allowing for the dynamic allocation of
network resources among a plurality of users, wherein the network resources and the users are
operably connected to a computer network, the computer readable instructions comprising:
~~a partition object space, defined in a computer readable memory, storing a plurality of~~
~~partition objects; the plurality of partition objects including at least one dynamic partition~~
~~object and at least one user partition object;~~
        a traffic class database storing traffic classes in association with corresponding dynamic
partition objects;

                wherein the at least one dynamic partition object has at least one attribute
                defining a first allocation of a network bandwidth ~~resource~~ to a corresponding
                traffic class and at least one attribute defining a second allocation, within the
                first allocation, of the network bandwidth ~~resource~~ across all data flows
                corresponding to a user;
                wherein the at least one user partition object has at least one attribute defining
                an allocation of the network bandwidth ~~resource~~ to a user;
        a partitioning mechanism ~~operably~~ connected to the computer network to receive and
transmit data flows, ~~the partitioning mechanism further operative to:~~
           and to identify a new data flow and the traffic class associated with the new data
flow; and,
        a partition management module ~~operative to~~ that
                accesses a ~~the~~ partition object space in a ~~the~~ computer-readable memory, wherein
the partition object space stores a plurality of partition objects; the plurality of partition objects
including at least one dynamic partition object and at least one user partition object; and, in
response to the new data flow, ~~to~~:
                ~~identify~~ identifies the dynamic partition object associated with the traffic class of
                the new data flow;
                ~~identify~~ identifies a new user based on one or more attributes of at least one

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          packet of the new data flow;

          dynamically creates a user partition object as a child of the identified dynamic

partition object in the partition object space in response to an identification of a

new user according to the at least one attribute of the identified dynamic

partition object;

          returns the user partition object to the partitioning mechanism;

     wherein the partitioning mechanism is further operative to enforces the allocations

defined in the user partition objects to control access to the network bandwidth resource

among a plurality of users.

9. (currently amended) The computer-readable medium apparatus of claim 8 wherein the

partition management module is further operable to reclaim inactive partition objects from the

partition object space.

10. (currently amended) An apparatus operable A computer-readable medium stored therein

computer-readable instructions executed by a computer processor to dynamically allocate

access to a network resource among a plurality of users, the computer-readable instructions

comprising:

          a computer-readable memory supporting a finite number of partition objects;

          a partition management module operative to that

                accesses the a partition object space defined in a computer-readable memory

supporting a finite number of partition objects, computer-readable memory and to:

                identify identifies new users based on at least one attribute of packets in data

flows;

                dynamically creates user partition objects in the partition object space memory,

in response to the new users, wherein the partition object space memory space comprises a

plurality of partition objects including at least one dynamic partition object having at least one

attribute defining a first allocation of a network bandwidth resource across all data flows

corresponding to the at least one dynamic partition object, and a second attribute defining

allocations of the network bandwidth resource within the first allocation;

wherein the dynamically-created user partition object is a child of the dynamic partition object and defines a partition including the second attribute of the dynamic partition object for managing aggregate bandwidth across all data flows corresponding to a given user; and,

a partitioning mechanism ~~operative to enforce~~ <u>enforcing</u> the partitions defined in the partition objects to control access to the network <u>bandwidth</u> ~~resource~~ among a plurality of users.

11. (currently amended) A computer-implemented method allowing for dynamic allocation of network bandwidth, the method comprising the steps of:

recognizing a new user of <u>network bandwidth</u> ~~a network resource~~ based on one or more attributes of at least one packet in a data flow;

accessing a memory space comprising a plurality of partition objects including a dynamic partition object having at least one attribute defining a first allocation of network bandwidth across all data flows corresponding to the at least one dynamic partition object, and a second attribute defining user partition allocations of the network bandwidth within the first allocation;

selecting a partition object from the plurality of partition objects based on one or more attributes of the data flow; and

if the selected partition object is the dynamic partition object, creating a user partition object as a child of the dynamic partition object on demand for the new user, wherein the user partition object is operable to allocate utilization of the network bandwidth, according to the second attribute defined in the dynamic partition object, across all data flows corresponding to the new user; and,

disposing of the user partition object when no longer needed.

12. (previously amended) The method of claim 11 wherein the disposing step comprises the steps of

reclaiming the user partition object for a subsequent new user if the user partition object is inactive.

13. (previously amended) The method of claim 11 further comprising

receiving a set of parameters defining the dynamic partition object.

14. (previously amended) The method of claim 11 wherein the user partition object is configurable based on a characteristic of the user's utilization of the network bandwidth.

15. (previously amended) The method of claim 11 wherein the user partition object is operable to provide a minimum allocation of the network bandwidth to the new user.

16. (previously amended) The method of claim 11 wherein the user partition object is operable to limit utilization of the network bandwidth.

17. (previously amended) The method of claim 11 wherein the user partition object is implemented by class-based weighted fair queuing functionality.

18. (previously amended) The method of claim 11 wherein the user partition object is implemented by committed access rate functionality.

19. (canceled)

20. (currently amended) A computer-implemented method allowing for dynamic allocation of network resources, the method comprising the steps of

receiving a set of parameters defining [[the]] a dynamic partition object and a partition cap parameter defining a desired limit on the number of user partitions;

recognizing new users of network bandwidth a-network-resource based on one or more attributes of at least one packet in a data flow;

accessing a memory space comprising a plurality of partition objects arranged in a hierarchical partition configuration, the plurality of partition objects including [[a]] the dynamic partition object having at least one attribute defining a first allocation of the network

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bandwidth a~network~resource across all data flows corresponding to the dynamic partition
object, and a second attribute defining user partition allocations of the network bandwidth
resource within the first allocation;

    if a number of existing user partitions does not exceed the partition cap, creating user
partition objects on demand for new users, wherein each user partition object is a child of a
corresponding the dynamic partition object and operable to allocate utilization of the network
bandwidth resource, according to the user partition allocation defined by the second attribute,
across all data flows corresponding to a user; and,

    reclaiming inactive user partition objects for subsequent new users.

21. (previously amended) The method of claim 20 wherein inactive user partitions are
reclaimed when necessary for subsequent new users.

22. (previously amended) The method of claim 20 wherein inactive user partitions are
reclaimed automatically.

23. (canceled)

24. (currently amended) The method of claim 20 further comprising the steps of

    receiving a set of parameters defining an overflow partition, wherein the overflow
partition defines an aggregate allocation of the network bandwidth resource for data flows
associated with users assigned to the overflow partition; and

    automatically assigning new users to the overflow partition, if the number of user
partitions exceeds the partition cap.

25. (currently amended) A computer-implemented method allowing for dynamic allocation of
network resources, the method comprising the steps of

    recognizing new users of network bandwidth a~network~resource based on one or more
attributes of at least one packet in corresponding data flows;

    accessing a partition object space comprising a plurality of partition objects arranged in

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a hierarchical partition configuration, the plurality of partition objects including a dynamic partition object having ~~at least one~~ a first attribute defining a first allocation of the network bandwidth ~~a network resource~~ across all data flows corresponding to the ~~at least one~~ dynamic partition object, and a second attribute defining user partition allocations of the network bandwidth ~~resource~~ within the first allocation;

selecting partition objects from the plurality of partition objects based on one or more attributes of the data flow; and

for selected partition objects that are dynamic partition objects, dynamically creating user partition objects in the partition object space on demand for the new users, wherein each user partition object is a child of the corresponding dynamic partition object and includes the second attribute;

enforcing the allocations of the network bandwidth defined in the dynamic and user partition objects on data flows traversing a network path;

monitoring use of the user partition objects; and,

reclaiming inactive user partition objects in the partition object space for subsequent new users, as needed.

26.   (currently amended) A computer-implemented method facilitating the dynamic allocation of network resources, the method comprising the steps of:

recognizing a new user based on one or more attributes of at least one packet in a data flow;

associating a traffic classification to the data flow;

accessing a partition object space comprising a plurality of partition objects arranged in a hierarchical partition configuration, the plurality of partition objects including a dynamic partition object having at least one attribute defining a first allocation of network bandwidth ~~a network resource~~ and a second attribute defining user partition allocations of the network bandwidth ~~resource~~ within the first allocation;

identifying [[a]] the dynamic partition object based on the traffic classification associated with the data flow;

creating a user partition object as a child of the dynamic partition object on demand for

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the new user, wherein the user partition object includes an allocation of the network <u>bandwidth</u>
~~resource~~ for all data flows corresponding to the new user according to the user partition

allocation defined by the second attribute of the identified dynamic partition object;

    associating the user partition object with the data flow; and,

    disposing of the user partition object when no longer needed.

27. (previously amended) The method of claim 26 wherein the disposing step comprises

    reclaiming the user partition object for a subsequent new user.